

What is a species?

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On reading Dr. Gleason's comments on species on pages 43-45 of the March-April number of *TORREYA* I feel that his philosophy (perhaps not intended to be taken too seriously) is wrong. He says: "Suksdorf may or may not be justified in making so many species." Suksdorf, in my judgment, never *made* a species in his life; he only *described* what he *supposed* were species. Müntzing and Erlanson may be said to have made species, in the manner indicated below. Then Dr. Gleason offers a definition: "A species is a group of one or more individuals which in *your* opinion deserves a binominal name." To me species are objective realities in nature, and subjective opinions do not in the least affect their existence or number. But, it may be replied, is not the conception of a species a product of the human mind, and do not as a matter of fact the number of species differ with the opinion of botanists? Thus Müntzing, in a recent discussion of the cytology of *Potentilla*, states that *P. argentea* L. has different chromosome-races within the species. There are diploid, hexaploid and octoploid races. These plants also differ in appearance, yet Müntzing concludes that "there seems to be no reason to split *P. argentea* into a great number of 'species' of the *Hieracium* type, though this might certainly be easily done." Perhaps someone will do it, and then the number of species of *Potentilla* will appear to rest, not on the actual facts, about which there is no dispute, but upon the opinion of this or that botanist. However, the ordinary conception of a species is that of a group of individuals remaining normally isolated in nature, and exhibiting special specific characters. This is a loose definition, but sufficient to cover the various aspects of the subject. Among insects, which are more specialized and standardized than plants we find pairs of species which are so much alike that it is difficult for experts to distinguish them, yet observation shows them to be quite distinct entities in nature. We also find cases where the ranges of related species meet and crossing occurs. Among plants, it is easy to see that apparently good species may be dissolved into a variable hybrid population. A very good case is that of the blue *Aquilegia caerulea* and the yellow *A. chrysantha*. As they exist in nature, occupying different ranges, they are excellent species. But in gardens they

cross readily, giving rise to fertile hybrids. If the ranges of these plants came to overlap there would arise a variable population which no botanist arriving after the event could break up into two species.

Most remarkable is the recent production,—one may fairly say creation,—of species through crossing. Müntzing crossed *Galeopsis pubescens* with *G. speciosa*, and was eventually able to extract a plant which did not differ at all from the well-known species *G. tetrahit*. This plant was fertile, and the stock can be carried on indefinitely. Heribert Nilsson crossed the willows *Salix caprea* and *S. viminalis*, and obtained a plant which morphologically could not be distinguished from *S. cinerea*. Mrs. E. W. Erlanson, in a recent paper on American roses, remarks: "*Rosa rudiuscula* is a natural hybrid between *R. carolina* and *R. arkansana* (the Western Prairie rose), as I was able to prove by producing it experimentally. It is so characteristic of the rose flora of northwestern Indiana, Illinois, and eastern Iowa that it should be given specific rank." (American Rose Annual, 1932.)

Species are not all of equal rank, if by that we mean antiquity and distinctness, but on the face of the landscape they are real entities, to be studied and discriminated. The recognition of subspecies is a useful device for associating together minor types in groups or aggregate species, and thus avoiding the excessive multiplication of independent binomials. It is quite true, as Dr. Gleason indicates, that legitimate differences occur as to the placing of these forms. In this sense it is perfectly true that the number of species is a matter of opinion. But the number of different kinds of plants is not, and it is I believe a dangerous and false doctrine (met with not infrequently) that species do not truly exist in nature, but are products of human mentality. I would put it this way. The pattern of nature is woven in an intricate fashion, and it was so woven ages before man came on the scene. It is man's opportunity to observe this pattern, recognize its details and reason about the operating causes. To do this is one of the highest functions of the human mind. But truth must always be derived from reality, and all departures from veracity are unscientific.

The inevitable disagreements are partly due to mere mistakes, to be corrected by further observation; and partly due to differences of terminology, to be corrected by conference and agreement.

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